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Original Research

Assessment of factors affecting success of dental implants- A clinical study

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ABSTRACT

Background:The use of dental implants is now a widelyaccepted treatment modality for fully and partially edentulous patients. The present study was conducted to assess success rate of dental implants in population.
Materials & Methods: It comprised of 10 dental implants whose failure rate was assessed.
Results: 10 implants with length < 10 mm showed failure, 4 implants out of 25 implant with length 10-11.5 mm showed failure and 6 implants out of 35 implants with size >11.5mm showed failure. Out of 45 implants placed in bone with type I quality, 6 showed failure. Out of 30 implants placed in bone with type II quality, 4 showed failure. Out of 20 implants placed in bone with type III quality, 3 showed failure. Out of 15 implants placed in bone with type IV quality, 3 showed failure. The difference was significant (P< 0.05).
Conclusion: Authors concluded that maximum dental implant failure was reported in dental implant with length less than 10 mm and in type IV bone.

Introduction

The use of dental implants is now a widelyaccepted treatment modality for fully and partially edentulous patients. The successof this approach is rooted in the inherentability of some dental materials, titanium inparticular, to osseointegrate, thereby creatingdirect bone-to-implant contact. Further improvements toward the successfulosseointegration of dental implantshave involved modifications to both surfacetopography and surface chemistry.[1]

The commonly accepted criteria for the assessment of implant success wereproposed by Albrektsson and colleagues to identifyclinical evidence of successful osseointegration and survival of implants.Over the past three decades, implant success has been assessed by survival

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rates, continuous prosthesis stability, radiographic bone loss, and absenceof infection in the peri-implant soft tissues.[2]

Long-term results ofimplants placed with guided bone regeneration, and outcomesfor the treatment of atrophic posterior maxillahave also beenreported.[3]Moreover, the use of dental implants can often avoid the integration of unrestored adjacent teeth or the use of a removable prosthesis. Implant systems characterized by micro-rough surfaces and internal abutment connections result in successful healing and long-term clinical performance.[4] Nonetheless, it should be remembered that early failure (no or inadequate osseointegration, i.e., intimate bone-to-implant connection before functional loading) can also occur. Early failures account for approximately 2–6% (%) of implants placed, and the incidence can be even higher for implants placed in specific risk populations.[5]The present study was conducted to assess success rate of dental implants in population.

Materials & Methods

This retrospective study was conducted in the department of Prosthodontics. It comprised of 56 patients with 110 dental implants. The study protocol was approved from institutional ethical committee.All patients were informed regarding the study and written consent was obtained.

Data related to patientssuch as length of implant, diameter of implant, location of implant, bone quality were retrieved from the patient's record file. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant using chi- square test

Results

Table I Distribution ofpatients

Age group	Patient	Implant	P value
20-40 years	25	50	0.05
40-60 years	16	40	
>60 years	15	20	
Total	56	110	

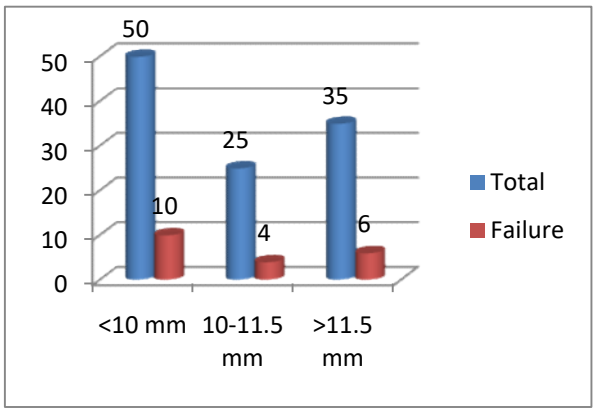
Table I shows that age group 20-40 years had 25 patients with 50 implant, age group 40-60 years had 16 patients with 40 implant and >60 years had 15 patients with 20 dental implants.The difference was significant (P< 0.05).

Table II Dental implant and failure rate

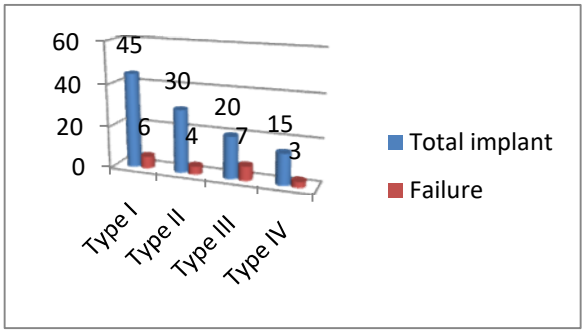
Implant length	Total	Failure	P value
<10 mm	50	10	0.05
10-11.5 mm	25	4	
>11.5 mm	35	6	

Table II, graph I shows that 10 implants with length < 10 mm showed failure, 4 implants out of 25 implant with length 10-11.5 mm showed failure and 6 implants out of 35 implants with size >11.5mm showed failure. The difference was significant (P < 0.05).

Graph I Dental implant and failure rate



Graph II Bone quality and failure rate



Graph II shows that out of 45 implants placed in bone with type I quality, 6 showed failure. Out of 30 implants placed in bone with type II quality, 4 showed failure. Out of 20 implants placed in bone with type III quality, 3 showed failure. Out of 15 implants placed in bone with type IV quality, 3 showed failure. The difference was significant (P< 0.05).

Discussion

Since then, new parameters have been introduced to assess success in theachieving of lifelike implant restorations. These include health status andnatural-looking peri-implant soft tissues, as well as prosthodontic parameters,esthetics, and patient satisfaction. However, osseointegration remains thepredominant parameter in implant dentistry. It seems logical that the currentdefinition of success criteria should be comprehensive, to include these additional factors.[6]

There is still a lack of homogeneity in the dental literature on reportingcomplications at

both implant and prosthetic levels. A previous systematicreview has shown that as much as 38.7% of all implant-supported fixed partialdentures (FPD) for partially edentulous patients had some type of complicationduring the observation period of 5 yrs. Thisfinding highlights the importance of including prosthesis success in analysesof the overall success of dental implants.[7] The present study was conducted to assess success rate of dental implants in population.

In present study, age group 20-40 years had 25 patients with 50 implant, age group 40-60 years had 16 patients with 40 implant and >60 years had 15 patients with 20 dental implants. Buser et al[8] found that elevenstudies of low to moderate methodological quality were studied. Implants placed in sites with history of one and two implantfailures had a weighted survival rate (SR) of 88.7% and 67.1%, respectively. Implants placed in sites with aprevious early failure revealed a weighted SR of 91.8%.First implants presented higher SR than implants placed in sites withone or two previous implant failures. In contrast, implants placed insites with one and two implant failures had similar SR.

We 10 implants with length < 10 mm showed failure, 4 implants out of 25 implant with length 10-11.5 mm showed failure and 6 implants out of 35 implants with size >11.5mm showed failure.Albrektsson et al[9] found that9 out of 186 implants (4.8%) placed in 106 participants failed before incorporation of the final prosthesis. The use of shorter implants (< 10 mm) and the need for augmentation procedures were associated with a greater risk of early implant failure. For shorter implants, the risk was 5.8 times greater than that for longer implants ($p = 0.0230$). Use of augmentation procedures increased the risk by a factor of 5.5 ($p = 0.0174$).Implants placed in the dental practice with a specialization in implantology heal successfully. The use of augmentation procedures and of implants shorter than 10 mm seems to be associated with a greater risk of early implant failure.

Gallucci et al[10] proposed success criteria for implant FCDPsbased on implant, peri-implant tissues, prosthodontic, and subjective parameters. They reported a95.5% survival rate vs. an 86.7% success rate when their proposedsuccess criteria were applied. FCDPs were deemed as

successful when a total of four or fewer complications (mild ormoderate severity) were encountered, and these could beaddressed chair-side in a single visit. Additionally, patient satisfactionwith overall treatment was rated good or excellent forthe treatment outcome to

be considered successful.

Conclusion

Authors concluded that maximum dental implant failure was reported in dental implant with length less than 10 mm and in type IV bone.

References

1. Rupp F, Liang L, Geis-Gerstorfer J, Scheideler L, Hüttig F. Surface characteristics of dental implants: a review. Dent Mater. 2017;34:40-57.

2. Ketabi M, Deporter D, Atenafu EG. A systematic review of outcomes following immediate molar implant placement based on recently published studies. Clin Implant Dent Relat Res. 2016;18:1084–94.

3. Abou-Ayash S, Strasding M, Rücker G, Att W. Impact of prosthetic material on mid- and long-term outcome of dental implants supporting single crowns and fixed partial dentures: a systematic review and meta-analysis. Eur J Oral Implantol. 2017;10:47–65.

4. Chrcanovic BR, Kisch J, Albrektsson T, Wennerberg A. Factors influencing early dental implant failure. J Dent Res. 2016;95:995–1002.

11. Grisar K, Sinha D, Schoenaers J, Titiaan D,

5. Constantinus P. Retrospective analysis of dental implants placed between 2012 and 2014: indications, risk factors, and early survival. Int J Oral Maxillofac Implants. 2017;32:649–54.

6. Sharma et al. Mechanical state assessment of the implant-bone continuum:a better understanding of the Periotest method. Int J OralMaxillofac Implants. 1995;10:43-9.

7. Esposito M, Grusovin MG, Coulthard P, Thomsen P, WorthingtonHV. A 5-year follow-up comparative analysis of the efficacy ofvarious osseointegrated dental implant systems: a systematic reviewof randomized controlled clinical trials. Int J OralMaxillofac Implants. 2005;20:557-68.

8. Buser D, Mericske-Stern R, Bernard JP, Behneke A, BehnekeN, Hirt HP, Belser UC, Lang NP. Long-term evaluation ofnon-submerged ITI implants. Part 1: 8-year life table analysisof a prospective multi-center study with 2359 implants. Clin OralImplants Res. 1997;8:161-72.

9. Albrektsson T, Branemark PI, Hansson HA, Lindstro¨m J.Osseointegrated titanium implants. Requirements for ensuringa long-lasting, direct bone-to-implant anchorage in man. ActaOrthop Scand. 1981;52:155-70.

10. Gallucci GO, Doughtie CB, Hwang JW, Fiorellini JP, Weber HP.Five-year results of fixed implant-supported rehabilitations with distalcantilevers for the edentulous mandible. Clin Oral Implants Res 2009; 20:601-607.